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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,465	07/07/2003	Tehsin Lee	3304.2.66	7607

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MADSON & METCALF
GATEWAY TOWER WEST
SUITE 900
15 WEST SOUTH TEMPLE
SALT LAKE CITY, UT 84101

EXAMINER	
CULBERT, ROBERTS P	

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,465	LEE ET AL.	
	Examiner	Art Unit	
	Roberts Culbert	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *16-18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/7/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8, 10, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,006,764 to Chu et al. in view of U.S. Patent Application Publication 2001/0038976 to Tanabe et al.

Regarding Claims 1 and 10, and referring to Figure 2 and the related discussion, Chu et al. teaches a method for post-treating a dry-etched metal film (114) the dry-etched metal film comprising an unetched portion and an etched portion exposed from said photoresist and having thereon an etching by-product (Cl components) the method comprising the steps of: using a stripping agent to remove said photoresist. (Col. 2, Lines 17-20)

Regarding Claims 6 and 13, Chu et al. teaches that a suitable solvent for photoresist removal is monoethanolamine (Col. 5, Lines 15-25)

Tanabe et al. also teaches that a stripping solution including monoethanolamine as the main ingredient is conventional in the art for removing photoresist from an etched aluminum film. (Paragraph 3)

It would have been obvious to one of ordinary skill in the art at the time of invention to use monoethanolamine as the amine based stripping agent for photoresist removal as suggested by Chu et al. and Tanabe et al. in order to readily and effectively remove the photoresist from the etched metal film in the conventional manner.

Regarding Claims 4 and 12, Chu et al. teaches that the etching by-product is $AlCl_x$ (Col. 2, Line 12)

Regarding Claims 2, 3, and 11, Chu et al. teaches that the metal film is aluminum or aluminum alloy (Col. 1, Lines 45-47)

Chu et al. does not explicitly state that the stripping agent reacts with the etching by-product to form a passivation layer on the exposed metal film. However, since Chu et al. suggests using monoethanolamine (MEA) for stripping photoresist and further teaches that the etching by-products remain on the substrate after the first prior art removal process (Col. 1, Lines 65-67) and are the same products as in the claimed invention ($AlCl_x$), the passivation layer would be formed by the reaction with the by-products during the stripping process.

Regarding Claim 5, since the passivation layer is formed by the reaction between the reaction products and the stripping agent, and the reaction products ($AlCl_x$) and the stripping agent (MEA) are the same in the prior art method and the claimed invention, the passivation layer would be the same and have the same properties including being substantially non-reactive to water.

Chu et al. does not teach using a washing agent to remove the passivation layer after the photoresist is removed.

However it is well known in the art of removing a photoresist that the photoresist may be suitably stripped with an amine based solvent such as monoethanolamine (MEA) and subsequently rinsed in a washing agent and water.

Tanabe et al. teaches that it is conventional in the art to remove a photoresist with an organic amine such as monoethanolamine (MEA) and then washing with a washing agent and purified water. (Paragraph 3)

It would have been obvious to one of ordinary skill in the art at the time of invention to use a suitable rinsing agent after the stripping step of the prior art method disclosed by Chu.

One of ordinary skill in the art would have been motivated at the time the invention was made to use the isopropyl alcohol rinsing step of Tanabe et al. in order to completely wash away the remover solution in the well-known manner. The removal of the photoresist would remove the passivation layer since the removal agent is the same as in applicant's claimed invention.

Regarding Claims 7 and 13, Tanabe et al. teaches using isopropyl alcohol as the washing agent (Paragraph 3)

Regarding Claims 8 and 14, the stripping method is substantially performed immediately after the dry etched metal film is formed. (Col. 1, Lines 53-54)

Claims 9, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,006,764 to Chu et al. in view of U.S. Patent Application Publication 2001/0038976 to Tanabe et al. as applied above to claims 1-8, 10, 11, 13 and 14 and in further view of applicants admitted prior art (APA).

Regarding Claim 12, Chu et al. teaches that the etching gasses are chlorine based, but does not explicitly teach that the etching gas is one of CL_2 and BCl_3.

However, the admitted prior art (APA) teaches that the claimed etch gasses are conventional in the art of etching aluminum with chlorine based gasses.

It would have been obvious to one of ordinary skill in the art at the time of invention to use the conventional etch gasses to etch the aluminum film of Chu et al.

One of ordinary skill in the art would have been motivated at the time the invention was made to use the conventional etch gasses in order to provide a suitable and effective means of etching the aluminum film of Chu et al.

Regarding Claims 9 and 15, Chu et al. teaches that the photoresist is first removed using a process gas of a fluorine-containing gas and an oxygen gas. (Col. 1, Lines 60-63) However, Chu et al. does not teach that the fluorine containing gas is CF_4.

The admitted prior art teaches that known plasma process gasses include CF_4/O_2 , $H2O(g)/O_2$ and $(C_xH_yF_2)$

It would have been obvious to one of ordinary skill in the art at the time of invention to use the conventional gasses to remove the photoresist as taught by the admitted prior art.

One of ordinary skill in the art would have been motivated at the time the invention was made to use the conventional etch gasses in order to provide a suitable and effective means of removing the photoresist from the aluminum layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

P. Hassanzadeh
SPE, AU 1763

R. Culbert R. Culbert